Cautions of LSR line

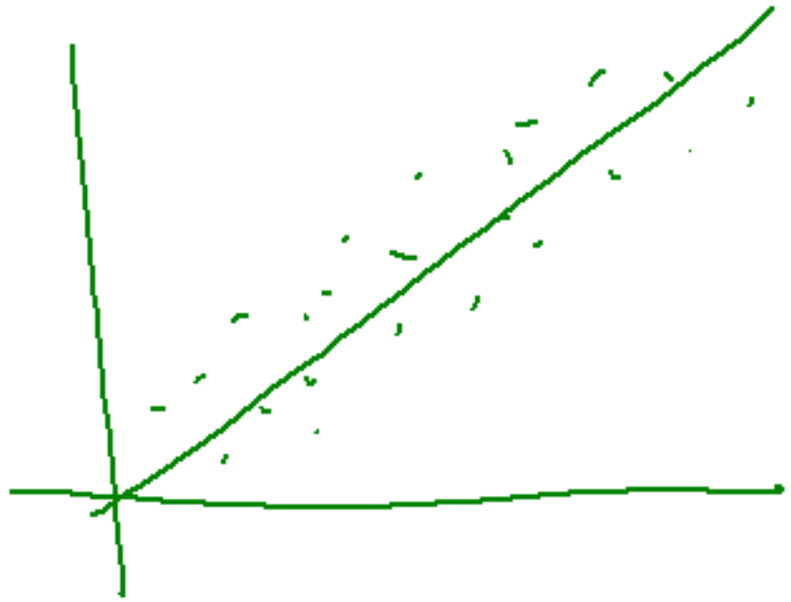
Residuals (errors):

= **actual - predicted (from LSR line)**

= $y_i - \hat{y}_i$

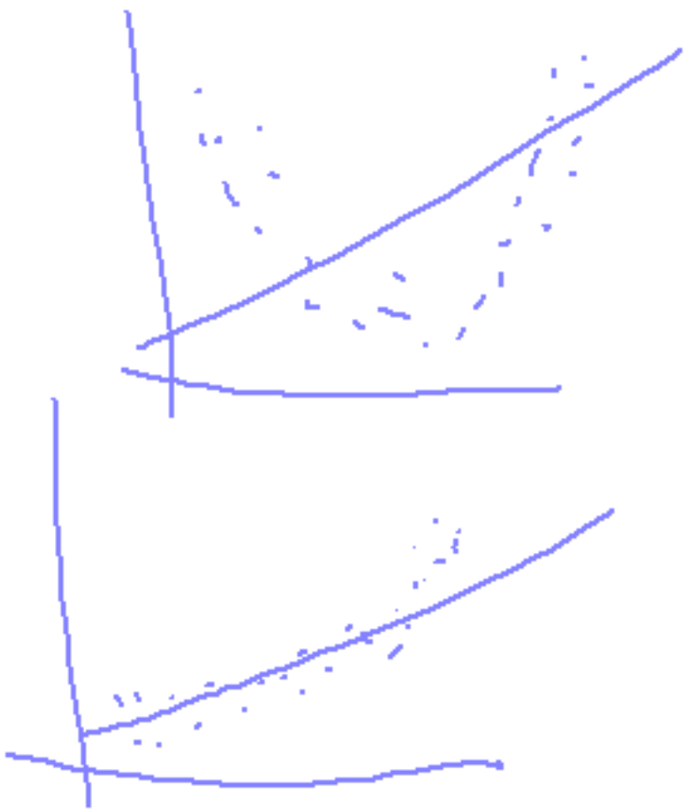
$\sum residuals =$ 0

$\bar{x}_{residuals} =$ 0



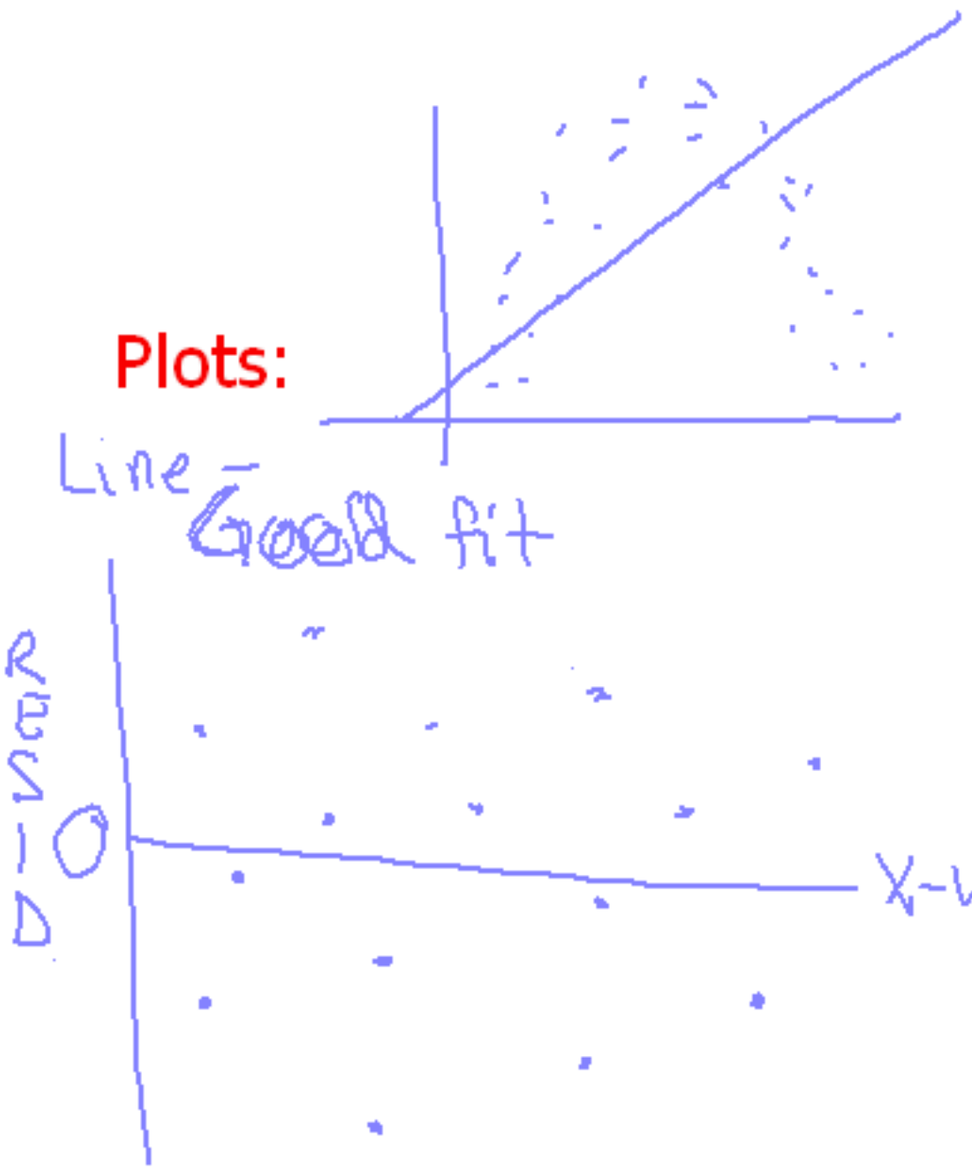
Residual Plot:

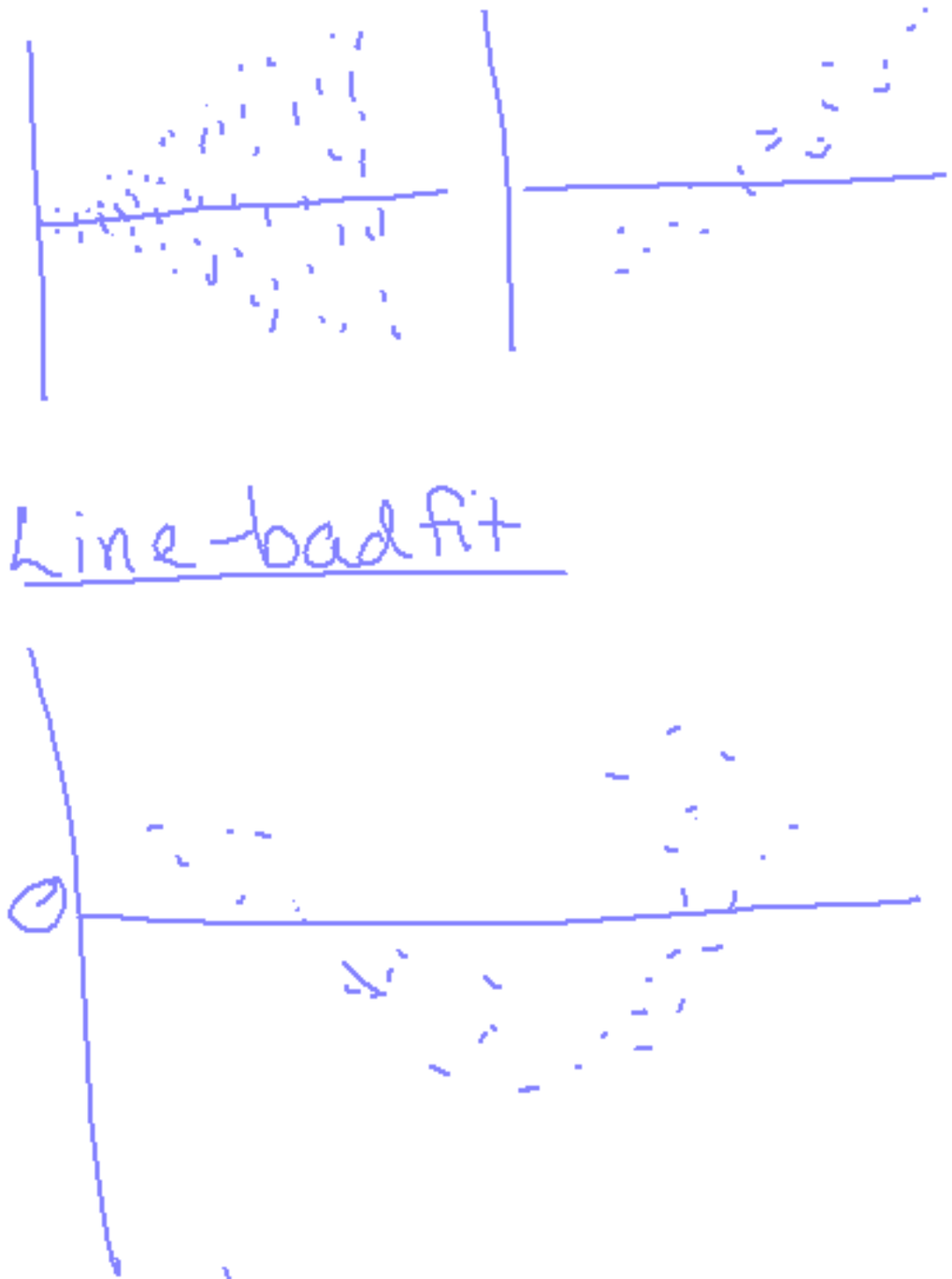
- Definition: **scatterplot of explanatory variable vs. residuals** (x-var) (y-var.)
- Helps... us see if LSR line is a good fit for plot.
- No pattern = scattered = good fit
- Pattern = another model (form) would be better
- Can show...
  - Lurking variables =



on calculator:

Plots:





Regression Statistics	
~~Multiple R~~	~~0.[illegible]~~
R Square r^2	0.780785799
~~Adjusted R Square~~	~~0.[illegible]~~
~~Standard Error~~	~~1.[illegible]~~
Observations $n=$	15

	Coefficients	*Standard Error*	*t Stat*	*P-value*
Intercept (constant) a	-1.73106061	2.04612023	-0.84602	0.4128433
Minutes (x-var) b	0.549242424	0.080716215	6.80461	1.25E-05

For every 1 min spent w/ customer, there are 0.549 policies sold on average.

What is the equation of the LSR line relating minutes spent and policies sold.

$\hat{y} = a + bx$ $\quad \hat{y} = -1.731 + 0.549x$

$\hat{y} = ax^0 + bx^1$

What is the value of *r*? What is the value of *r2*?

$r = 0.884$ $\quad r^2 = 0.781$

$\frac{\Delta Y}{\Delta X} = \frac{0.549 \text{ policies}}{1 \text{ minutes}}$

Interpret the slope in the context of the problem?

The following is a MINITAB regression printout relating average number of degree-days per month to gas consumption (in cubic feet).

Predictor		Coef	StDev	T	P
Constant	a	123.24	28.60	4.31	0.004
x Degree-d	b	20.221	1.145	17.66	0.000

S= [illegible] R-sq = 97.8% R-sq(adj) = 97.5%

1. What is the equation of the LSR line relating degree days to gas consumption?

$\hat{y} = 123.24 + 20.221x$

2. What is the value of r? What is the value of r2?

$r \approx 0.9889$ $r^2 = 97.8\% = 0.978$

3. Interpret the slope in the context of the problem?

**** this was done on #40 in the HW****